

Nova MIM's Work Project

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Business Project:

**IBM Research – Analysis and Development of
Selected IBM Products in relation to Contextual
Awareness**

Contents

Context:	3
Client:	3
Current Client Situation:.....	3
Market Overview:.....	3
The Business Project Challenge:.....	4
Reflection on the work done:.....	5
The original approach:.....	5
Evolution over time:	7
Limitations of the approach used:.....	11
What could have been done differently:	12
Reflection on learning:	13
Previous knowledge applied:	13
New knowledge gained:	14
Personal Experience:	15
Benefit of hindsight:	16
Conclusions:.....	16
Sources:	18



Context:

Client:

IBM Research is a subsidiary of International Business Machines Corporation (IBM), with offices all over the world and fields that vary from computers that can think and play Jeopardy, to fridges that know when your food items have gone bad. This managed to earn IBM around 67,000 U.S. patents since 1993. In 2012 alone, they registered a staggering number of 6,478 patents, exceeding the numbers of Accenture, Amazon, Apple, HP, Intel, Oracle/SUN and Symantec combined (IBM, 2012).

Current Client Situation:

IBM Research in Ireland only opened its gates in 2011 and focuses on advancing science and technology for intelligent urban and environmental systems. They currently do research in Water, Energy and Transportation, Marine environment, City fabric, Risk and Exascale computing. Their main area of research titles “*Building a smarter planet*” and includes the following three areas (IBM, 2011):

- Smarter Water:
This deals with the improvement of water quality and energy costs.
- Smarter Energy:
Smarter Energy is trying to build smarter power grids in order to reduce the number of power outages.
- Smarter Transportation:
This area manages large volumes of diverse data to monitor transportation systems such as bus or tram.

Market Overview:

IBM Research has acquired a rather unique position within the market, due to their broad research spectrum. Within each main focus area, described above, IBM Research has a wide



hierarchy of products and programs that are being developed. They are working with municipalities such as the Dublin City Council (DCC), with which they develop Dublin into a prototype of a “smarter city”. An example for this would be a close collaboration where the DCC not only allows them to work, but provides them with past data and IBM Research equips city buses with GPS tracking devices to make the bus schedule more accurate. As Dublin is a prototype for this approach, we might see many more “smart cities” in the near future, all over the world.

The Business Project Challenge:

Every year, IBM releases a “Global Technology Outlook”, to give the world an insight of what they believe will be a trend in the near future and businesses should focus on in order to keep/get a competitive advantage. In 2013 the GTO contained the following six topics:

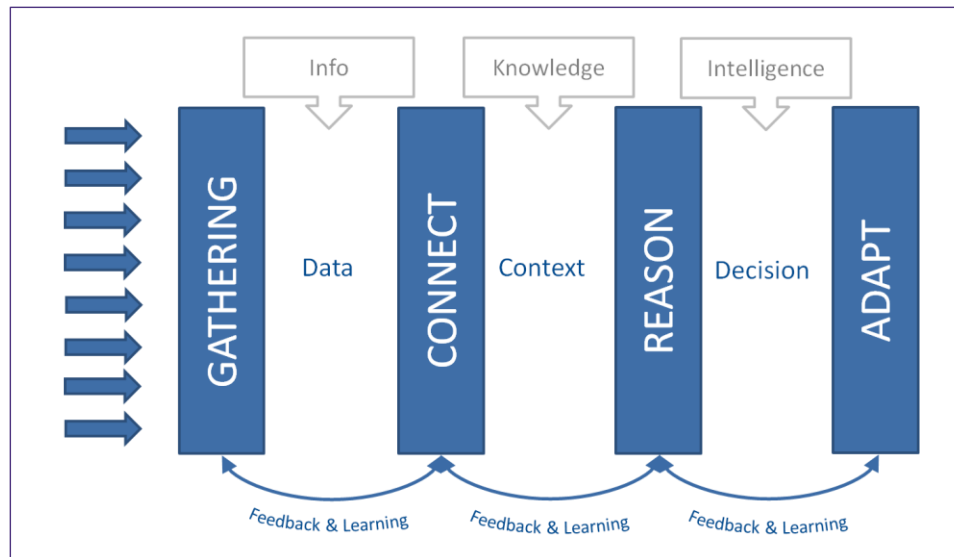
- Contextual Enterprise
- Future of Analytics: Multimedia and Visual Analytics
- Mobile First
- Scalable Services Ecosystem
- Software Defined Environments
- The Future of Education

Together with our IBM contact person Karl Quinn, we decided on focusing on the topic Contextual Enterprise. Contextual Enterprise is a synonym for something humans do almost every day, which is analyzing the environment surrounding us and reacting appropriately to it. As we have a brain that can make these assessments very fast, this comes naturally to us. A computer program however, has significant difficulties of doing so. With the technologies nowadays this is still not easy to implement, but far from impossible.



We can split up Contextual Computing in four basic pillars that describe the processes involved. Chronologically these are:

Figure 1: Diagram of Contextual Enterprise



IBM found itself in the position of having done huge amounts of research on the topics above, but also realized that some of their products, released prior to the GTO, probably do not comply with the standards raised this year. They therefore asked a group of CEMS students to choose products from the wide range IBM had to offer and to analyze each product on the basis of the above mentioned “pillars of contextual enterprise”. Once the group familiarized with the products, they, in collaboration with product managers from each individual field, could come up with solutions on how to improve the products in regards to contextual awareness.

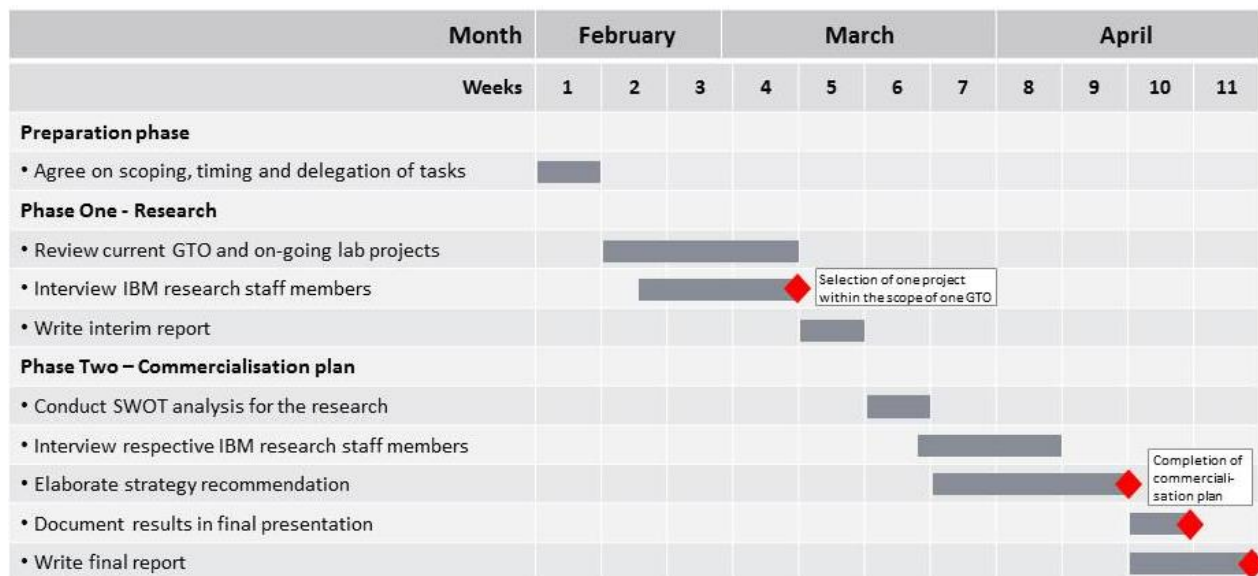
Reflection on the work done:

The original approach:

The original approach towards the business project that was given to us by IBM was that we would sign an NDA (Non-Disclosure Agreement) and get the opportunity to read the Global

Technology Outlook of 2013 before it would be published. The idea was then to go to their research facility in Dublin and talk to the researchers about what they are working on at the moment. We then would have applied one of the topics of the GTO on a currently researched product in the fields of smarter energy, smarter water or smarter transportation. Once this would have been done, we then would have written a detailed business plan on how to monetize the new product and delivered that to IBM Research. In the first meeting, Karl Quinn was very helpful, as that he told us exactly what he wanted delivered, and when he wanted it delivered. To him, it was very important that we would have a very clear and detailed structure, which is why he strongly advised us to use a Gantt Chart as seen in *Figure 2*.

Figure 2: Initial Gantt Chart of the Business Project



After that, we developed a detailed plan on how to quickly start the project. Karl asked us to develop an interim report that we would constantly update with new information and findings, we come across. We should start with writing a general overview of our products, where we mention how they are unique and what their purpose is. Then we should incorporate the degree of contextual awareness that our products have and explain how this helps the product in fulfilling its designated purpose. Finally, we should point out products that stand in direct competition to our products, followed by a SWOT analysis of each product, where we point out the Strengths,

Weaknesses, Opportunities and Threats. In the end of each individual product report, we should also include potential recommendations, on how to improve the products in regards to contextual awareness. On a bi-monthly basis, we then had to present our progress in front of our CEMS colleagues and the CEMS Program Manager. At the end of every presentation, we would show our Gantt chart in order to show everyone where we were in our progress. It all seemed to work out swimmingly, as our group was very happy with our project as well as the program manager and the people from IBM Research. However, along the way we came across a variety of problems.

Evolution over time:

First, we got the feeling that IBM was trying to avoid the advances of our group to set up meetings. Even though we were in constant email conversation with Karl Quinn, our inside IBM person, there always seemed to be a variety of reasons why we could not meet. After asking our Program manager of CEMS UCD Michael Smurfit, Dr. Jacob Eisenberg, he told us that they experience the same problems every year with different companies and that we should be patient, yet increasingly persistent over time. This caused problems, especially when we had to present our bi-monthly report. In the beginning, IBM did not give us any useful information that we could have started our report with, which is why we did not have much to present in front of our class and in front of Dr. Eisenberg. Eventually we met up with Karl Quinn, who told us that his direct superior at IBM Research Dublin is feeling uneasy about us reading the Global Technology Outlook of 2013 before it was officially published. As this came as a bit of a shock we decided to quickly develop a contingency plan in order to not lose any more time. We therefore met and started an attempt to brainstorm new ideas on how to still create value in the form of a business project. Knowing that the GTO would be released soon anyways, we decided to pick products from the IBM range of products that can be accessed from their webpage and familiarize as well as analyze them as good as we can until the GTO would be published. We quickly scheduled another meeting with Karl Quinn and informed him of our intention, which he seemed to approve and agree with. He then proposed a variety of products to us that we could choose from to work

with, but ultimately said that we could choose any IBM product there is, which can be found on their webpage.

The products we chose to analyze were:

- **IBM Enterprise Marketing Management (IBM EMM)**

A software that helps to integrate, analyze and manage cross-channel relationship marketing on online platforms, using new technologies to enable an increase in revenues and a reduction in costs. IBM EMM is able to assess four key functional areas of marketing, which are customer awareness, centralized decision-making, cross channel execution and integrated marketing operations. Through this software, IBM EMM's clients can determine which of their marketing campaigns are most effective and which ones are not working at all.

- **IBM Emptoris Supplier Lifecycle Management**

A software that provides customers with support in managing large numbers of suppliers and complex processes efficiently. In detail, we decided to look at the supplier risk module, which provides companies a holistic solution to identify, assess and control supplier risk efficiently.

- **IBM Connections**

A social platform developed explicitly for businesses, to provide them with the ability to collaborate in an innovative way. It facilitates the businesses' large network of experts, and can be used to discuss and test new ideas. It features a dashboard, that for the clients convenience, features items such as email, a calendar and an activity stream where the user can view and take action on content and events in context. Additionally, the software features a service providing social analytics, to discover trends in content and social activity for better decision-making.

- **IBM Infosphere BigInsights**

A software bundle used for Big Data Analytics. "Big data" and "Data mining" have been buzzwords for the past couple of years and will only gain in popularity in the near future, according to IBM's GTO. Big Insights bundles a database format with a variety of IBM's



already existing programs such as spreadsheets or a graphic user interface. This software can be used to e.g. monitor a large amount of social networks, where it filters out data coming from “status updates”, “tweets” or blog entries. It then stores it and analyzes it, using parameters that the user can decide on.

Karl Quinn told us that he also wanted a regularly updated interim report about the products we have chosen. This should include:

- A General product description
- What degree of contextual awareness the products already address
- Quick analysis of the competing products
- SWOT Analysis

We were in great luck, as not too much after we put this plan into action, the Global Technology Outlook 2013 was released. Timing was crucial now, as the deadline slowly came in reach. At this point, we were very grateful, because Karl Quinn offered to put us in contact with the different product managers of the products we chose and had familiarized by then. Most of the individual product managers were extremely helpful with providing us with additional insights and partly even excerpts of the product software, so we could round up our knowledge. Depending on the product, the relevant managers gave us more or less information. Before the interviews with the product managers, they wanted us to send them our interim report and a list with expectations we had from the information we wanted to get out of the call. Through this list, they could get a better idea of what we were looking for and what they should include in their presentation in order to create the maximum value for us. Karl attended almost every call we had with the managers, and listened to our conversation in order to get an idea of how familiar we already were with the products. Some calls included product demonstrations, whereas others focused on the different sub-products, the functionality or the competitors. With the insights we gained from talking to the product managers, we could in collaboration with them analyze the products to an even deeper extent and consequently develop potential improvements to the



products in regards of contextual awareness. As mentioned before, we also regularly updated our interim report with research that would accentuate our recommendations.

Over time, we also had to partly rewrite our competitor's analysis, as we wrote it before having talked to the product managers. Therefor we initially started with a competitor's analysis that we thought was most accurate, because the products partly covered the same tasks that our products did, but then adapted it after the interviews with the individual product managers. At that time we had a much better understanding of the products and could therefor come up with a better and more suitable competitor analysis.

Once we came up with a variety of recommendations for the different products, we met up to brainstorm whether the recommendations are viable and whether they could bring value to the product and to IBM. Once this was done, we asked the product managers about their thoughts and remarks, and listened to what they had to say about them. Luckily, they seemed to approve all of our recommendations and even mentioned that they had already thought about some of them, which was probably down to the fact that we worked together rather closely with them. One interesting discovery was that some of our recommendations they had already considered but have not developed yet, whereas others were completely new to them and, according to them, had potential for further research.

Another interesting observation we made throughout the project is that apart from the recommendations we had already proposed, we could further improve three of the four products by including IBM BigInsights in them. The first stage of contextual enterprise is the Gathering stage, as seen in *Figure 1*, and due to the reason that we had one of the best tools for gathering data on a big scale at our hands, we thought that all products could benefit from this, which is why we dedicated an entire section of our Business Report towards it. Whether it is used to foresee trends in the fashion industry, that can be used for marketing purposes by including it in IBM EMM or to shed further light on supplier profiles by including it in IBM Emptoris Supplier Lifecycle Management Supplier Risk. Having a strong analytics tool should be the core of all of the analyzed products in order to function more efficiently.



Once all of our recommendations were elaborated and approved by the product managers, we finalized our report and started forging the final presentation. In the beginning, we were told that we would give a presentation at the IBM premises, in front of Karl Quinn and the product managers, so we could have an elaborate Questions and Answers session in the end, followed by valuable feedback. Then, at one point, we were told that there was a slight change of plans, and that we would present only to Karl Quinn at our University. One day before the actual presentation, we receive an email, saying that Karl could not attend our presentation, due to health issues, and that he would ask a friend that also worked at IBM, to come and attend our presentation. Finally, at the day of our presentation we got another email that informed us of the fact that we would now do our presentation with IBM over Skype. This was a bit of a disappointment to all of us, as we were all really passionate about the project and the company. In the end however, Dr. Jacob Eisenberg seemed to be very happy with the outcomes of our presentation.

Limitations of the approach used:

The approach we were given by IBM Research was very different from what some of the other students were working on. Most of the other groups had difficulties as well at one point or another and some also had to completely change the approach they initially discussed with the company for a variety of reasons. Some were asked to conduct questionnaires and analyze the results in order to see trends in the company, etc. Not at IBM Research. They intentionally wanted us to focus entirely on their products in order to study and understand them to an extent that others do not. They then wanted us to apply our academic expertise on the individual fields and consequently suggest specific improvements. Surely, we could have as well collected data from questionnaires or other means of data, but after discussing it with IBM Research, we came to the conclusion that, in the timeframe given, our approach would be most suitable. However, given the case we would have had the time to conduct a questionnaire, we might have been able to improve on the quality of suggestions in the end. Being able to analyze data on the average customers' wants and needs could have changed our final output. Even though our products were very different from each other, I would have liked to have done a questionnaire in order to assess



general information. What comes to mind is people's opinion on cloud computing, mobile computing and big data, as these are "buzzwords" at the moment and are fields our products fit in. It is important to get an outside opinion, because even though our group was very diverse in its culture, we were slightly biased by the company. If we would have had additional information on what people from different social groups, from different cultures and/or different ethnicities, we would have had a better understanding on in which direction to develop our recommendations.

Another limitation was the delay in communication, right at the start of the project. If we would have had signed an NDA and consequently would have had access to the Global Technology Outlook right from the beginning, we would have saved a significant amount of time and could have done further research on the products.

Basically, our main strength was also our biggest limitation. Whilst some of the other groups chose a quantitative analysis, where they analyzed large amounts of data that they prior conducted, we decided on conducting a more qualitative analysis. This included conducting detailed interview with Karl Quinn and the product managers. In these interviews, we discussed the capabilities and opportunities of each. Even though IBM Research preferred it the way we ended up conducting our research, I think that partly they do so because they did not want to disclose their GTO's to us before they were published. If we would have had access to them in the first place, we could have set up a paper that consists of quantitative research as well as qualitative research. On the other hand, the advantage of using our approach was that we really knew the products in detail, and therefore, once we had the contact information of the individual product managers, we did not have to ask many questions regarding the rather technical products, but could dive right into detailed analyses.

What could have been done differently:

We could have tried to enforce the communication between us and the superiors at IBM Research even more, but I had the feeling that we were already touching the threshold of being a nuisance



to them. However, in the end our grades depended on it, which is what gave us the incentive of writing additional emails to them when they did not reply.

Another aspect of the business project I would have liked to further develop is the technical side. Even though we have analyzed the products fairly deeply, we were told not to go into too much technical detail. Coming from a technical background, I was completely taken up, analyzing the products. However, when we had to present our progress every second week and I was trying to explain some of the products, people seemed to have a hard time following my presentation. I found myself in a rather big dilemma, as with IBM, there were no communication problems at all, and naturally the deeper I would go into detail, the better my recommendations could have been. I realized at an early stage of the project that we had a limited time frame in which we had to finish our assignment. I therefore proposed that we each look into specific “modules” of the products, in order to not get carried away by the otherwise huge spectrum of product details. If we would have had more time at our hands, it would have allowed us to explore every technical detail and therefor to forge better recommendations.

Reflection on learning:

Previous knowledge applied:

Personally, I had the feeling that I was very well prepared for this task. I could rarely apply any specific contents per se into the project, but I could apply plenty of soft skills and segments of courses that I had developed over the time during my CEMS career up to that moment. Coming from a background different than Business, there were a few things that I learned during my Master that I included. Having pursued a major in “Innovation & Entrepreneurship”, there were plenty of opportunities where I could weigh in with knowledge gained from my time at NOVA School of Business and Economics. For example, I could make use of my skills from “New Product Development”, where I learned what basic elements a new product has to contain in order to appeal to a customer. Other courses that helped me with my project were “Management of Product Innovation” and “Entrepreneurship”. My strongest contribution however, was my ability of cross cultural management. Apart from me, our group consisted of a German, an



Austrian/Russian and an Australian. I came to realize at a very early stage that inside our team, there was a clear split in factions between the German and the Austrian being one faction, and the Australian being the other. My advantage was that I got along with everyone in the group. Which is why in the beginning, I acted as a mediator between factions. I realized that especially when there was an exchange in written communication, my team members seemed to get upset very quick with each other, which is why I had to “defuse” the situation sometimes. Towards the end however, the group learned how the others work and got along a lot better. Another skill that I learned throughout my master at NOVA School of Business and Economics was time management and organization. One big problem in our group was that we were split up. Due to the fact that our University, UCD Michael Smurfit Graduate School of Business, was not in the city center of Dublin, but rather far outside, at points it posed a problem on who commutes when. Half our group lived in the University Residence on campus, whereas the other half lived in the city center. Again, these sorts of inconveniences proved to be a problem in the beginning, but were resolved very early, when we made a plan on when we would meet and where. In the end, it was impossible to be prepared for this business project with knowledge that we prior acquired, because it was about specific products on a rather technical basis. However, one skill that my academic career in Lisbon gave me along the way was the ability of diving into a completely new project, and getting deep and profound knowledge in a short amount of time. By being confronted with a variety of different case studies in most of our classes, we learn how familiarize ourselves very quickly with a completely new subject. I believe that one of the main characteristics that CEMS students all have is that they love challenging themselves by doing exactly this, which is also why so many students want to go into consulting afterwards.

New knowledge gained:

Along the process of our project, I did acquire a variety of new skills. Apart from the rather detailed knowledge I now possess regarding contextual enterprise and Big Data Analytics, I learned how to approach a person in order to get something. As stated before, IBM did not excel at communication towards us, which left us in the situation of having to approach them more frequently, yet in a professional manner. According to our Program Director, it can happen a lot



during our future professional career that people will try to avoid us for a variety of reasons, which is why it is hopefully going to prove valuable in the future.

Personal Experience:

The value I brought to the team was definitely my technical knowledge that I acquired during my Undergrad degree. Even though my group members familiarized themselves very quickly with the subject, every once in a while they asked me questions about it. It also helped us to communicate more efficiently with some of the product managers, as they would usually answer to our questions in a very detailed way, using a lot of technical terms. Another strength I brought to the group was my ability to ease the inter-team communication. This is something I acquired partly at NOVA, while working in very diverse groups, but also from my other international backgrounds. I have always been interested in inter-personal communication and how people sometimes seem to struggle to accomplish it effectively.

My biggest strength also seemed to be my biggest problem somehow. Sometimes, especially after having long conversations with the product managers, I wrote parts of the interim report in a lot of detail. Neither my colleges, nor my Program Manager seemed to grasp what I was trying to say however, as they were lacking some of the technical terminology. Which is why, on a variety of occasions, I had to rewrite parts of the report to suit our readers. It was definitely a challenge, to write a report that is sufficiently detailed to reflect our understanding of the matter, yet still comprehensible for an audience that has no profound knowledge of the topic.

This is definitely something I should develop on in the future. Being able to address a group of people about a topic they are not familiar with and explaining it to them in a way they will understand. I always thought that my “human capital” is that I could combine the technical and the business side of a company, but throughout the project I learned that I possess skills from both fields but cannot always combine them. Another area of self-improvement I discovered was that depending on the situation, I should be less lenient with people. I usually assume that people work the same way I work, and ultimately gets done in a proper way and on time. This is also the reason why I told my group not to be too aggressive when sending email to our company. When I



think of it now however, it was definitely the right thing to do, as I believe it was due to these emails, we managed to accomplish our goal.

Benefit of hindsight:

In hindsight, what added the most value to our project were definitely the individual product managers from the IBM side, and our suggestions for the products from our side. Thanks to the managers, we had a lot of additional insights into the products that others usually have to pay for. It helped us significantly with our research and our recommendations. As a group that had not gotten the best impression of their business project enterprise, we were amazed, not just by how fast the product managers would reply to our emails concerning questions, but also how forthcoming and friendly they were. All of the emails I have written to the product managers were answered within the hour of my sending and were written in an extremely friendly way, yet very professional and to the point, which is everything but normal, considering that we were working with people from a Fortune 500 company who probably have much more important things to do than to help students with their university projects. Of course, we were very glad that they did and have expressed our gratitude in many emails, our final report and our presentation in front of the company. From our side, I believe that the recommendations add the most value to the project. They were individually all approved by the specific product managers who said that they already thought about some of them and were very surprised, in a positive way, of others.

Conclusions:

After having finished this project, I can draw a variety of conclusions. First of all, It was good to see that despite the fact that all of the group members came from more or less different cultures, they managed to work well together after a “warm-up phase”, which might have been due to the reason that we had a course in cross-cultural management in the same semester. Here, it is important that members of a team know that everybody works differently and that it needs a little time to adapt to other people’s working style.

Another conclusion that I made at a rather early stage of the project is that one should always adapt a presentation to the audience that is going to listen to it. This might be hard at times,



because different people have different backgrounds, but if someone does not understand the presentation, it is redundant. It is better to invest extra time in re-writing a presentation and having the audience understand what one tries to communicate, than presenting a point for a period of time, where people take more time asking questions than the actual presentation took.

The most important conclusion I drew from the project however, was that one can do the most detailed plan in the world, but if the counterpart does not take an active part in it, one should always have a contingency plan. It does not just show professionalism, but can also be a significant time saver. Time that can afterwards be used in a more productive way.



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